

~~The existing Appendix A, which contained a table related to the sliding scale TSS standard, is proposed to be deleted.~~

APPENDICES -- BASIC PERFORMANCE STANDARDS

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APPENDIX A. Erosion and sedimentation control

~~12/30/03~~ [This appendix applies to all projects.](#)

A person who conducts, or causes to be conducted, an activity that involves filling, displacing or exposing soil or other earthen materials shall take measures to prevent unreasonable erosion of soil or sediment beyond the project site or into a protected natural resource as defined in 38 M.R.S.A. § 480-B. [ErosionSediment](#) control measures must be in place before the activity begins. Measures must remain in place and functional until the site is permanently stabilized. Adequate and timely temporary and permanent stabilization measures must be taken.

NOTE: The site must be maintained to prevent unreasonable erosion and sedimentation. See 38 M.R.S.A. § 420-C (in part). A license is required for any stormwater discharge that the department "determines to contribute to a violation of a water quality standard or is a significant contributor of pollutants to waters of the State". 06-096 CMR 521(9)(a)(1)(v)(in part).

Other or additional standards than those provided in Appendix A may apply, under the Natural Resources Protection Act, to a project located in or adjacent to a protected natural resource.

[NOTE:](#) For guidance on erosion and sedimentation controls, consult "Maine Erosion and Sediment Control BMPs", Maine Department of Environmental Protection (2003).

~~(1)(2)~~ **Pollution prevention.** Minimize disturbed areas and protect natural downgradient buffer areas to the extent practicable.

The discharge may not result in erosion of any open drainage channels, swales, upland, or coastal or freshwater wetlands.

~~Note:~~[NOTE:](#) Buffers improve water quality by helping to filter pollutants in run-off both during and after construction. Minimizing disturbed areas through phasing limits the amount of exposed soil on the site through retention of natural cover and by retiring areas as

permanently stabilized. Less exposed soil results in fewer erosion controls to install and maintain. If work within an area is not anticipated to begin within two weeks time, consider leaving the area in its naturally existing cover.

(2)(3) Sediment barriers. Properly install sediment barriers at the edge of any downgradient disturbed area and adjacent to any drainage channels within the disturbed area. Maintain the sediment barriers until the disturbed area is permanently stabilized.

(3)(4) Temporary stabilization. Stabilize with seeding, mulch, mulch or other non-erodable cover any exposed soils that will remain unworkednot be worked for more than 14 days except, stabilizedays. Stabilize areas within 100 feet of a wetland or waterbody within 7 days of the initial disturbance of the soil or prior to a predictedany storm event, whichever comes first.

(4)(5) Removal of temporary sediment control measures. Remove any temporary sediment control measures, such as silt fence, within 30 days after permanent stabilization is attained. Remove any accumulated sediments and stabilize.

NOTE: It is recommended that silt fence be removed by cutting the fence materials at ground levelse as to avoid additional soil disturbance.

(5)(6) Permanent stabilization. If the area will remain unworkednot be worked for more than one year or has been brought to final grade, then provide permanent stabilizationpermanently stabilize using vegetation through planting, seeding, sod, or through the use of permanent mulch or riprap. If using vegetation for stabilization, select the proper vegetation for the light, moisture, and soilsoil and moisture conditions; amend areas of disturbed subsoils with topsoil or other organic amendments, topsoil, compost, or fertilizers; protect seeded areas with mulch or, if necessary, erosion control blankets; and schedule sodding, planting, and seedingsse to avoid die-off from summer drought and fall frosts. Newly seeded or sodded areas must be protected from vehicle traffic, excessive pedestrian traffic, and concentrated runoff until the vegetation is well-established. If necessary, areas must be reworked and restabilizedseeded and mulched again if germination is sparse, plant coverage is spotty, or topsoil erosion is evident. One or more of the following may apply to a particular site.

- (a) **Seeded areas.** For seeded areas, permanent stabilization means an 90% cover of the disturbed area with mature, healthy plants with no evidence of washing or rilling of the topsoil.
- (b) **Sodded areas.** For sodded areas, permanent stabilization means the complete binding of the sod roots into the underlying soil with no slumping of the sod or die-off.
- (c) **Permanent Mulch.** For mulched areas, permanent mulching means total coverage of the exposed area with an approved mulch material. Erosion Control Mix may be used as mulch for permanent stabilization according to the approved application rates and limitations.
- (d) **Riprap.** For areas stabilized with riprap, permanent stabilization means that slopes stabilized with riprap have an appropriate backing of a well-graded gravel or approved geotextile to prevent soil movement from behind the riprap. Stone must be sized appropriately. It is recommended that angular stone be used.
- (e) **Agricultural use.** For construction projects on land used for agricultural purposes (e.g., pipelines across crop land), permanent stabilization may be accomplished by returning the disturbed land to agricultural use.
- (f) **Paved areas.** For paved areas, permanent stabilization means the placement of the compacted gravel subbase is completed.

(g) Ditches, channels, and swales. For open channels, permanent stabilization means the channel is stabilized with mature vegetation at least three inches in height, with a 90% cover of healthy vegetation, with a well-graded riprap lining, or with another non-erosive lining capable of withstanding the anticipated flow velocities and flow depths without reliance on check dams to slow flow such as concrete or asphalt pavement. There must be no evidence of slumping of the channel lining, undercutting of the channel banks, or down-cutting of the channel.

~~(6)~~(7) Winter construction. "Winter construction" is construction activity performed during the period from November 1 through April 15. If disturbed areas are not stabilized with temporary or permanent measures outlined above by November 15, then the site must be protected with additional stabilization measures that are specific to winter conditions. Not by November 1 or new soil disturbance occurs after November 1 but before April 15, then these areas must be protected and runoff from them controlled by more than one acre of the site may be without stabilization at one time.

~~Site stabilization.~~ For winter stabilization, hay mulch is applied at twice the standard temporary stabilization rate. At the end of each construction day, areas that have been brought to final grade must be stabilized. Mulch may not be spread on top of snow.

~~Sediment barriers.~~ All areas within 100 feet of a protected natural resource must be protected with a double row of sediment barriers.

~~Ditches.~~ All vegetated ditch lines that have not been stabilized by November 1, or will be worked during the winter construction period, must be stabilized with an appropriate stone lining backed by an appropriate gravel bed or geotextile unless specifically released from this standard by the department.

~~Slopes.~~ Mulch netting must be used to anchor mulch on all slopes greater than 8% unless erosion control blankets or erosion control mix is being used on these slopes.

-additional measures and restrictions.

~~NOTE: For additional~~NOTE: For specific guidance on winter construction standards, contact the Department for a copy of the draft *Winter Construction Standards and Guidelines for Stabilizing Sites for Winter Construction.*

(8) ~~(7)~~ Stormwater channels. Ditches, swales, and other open stormwater channels must be designed, constructed, and stabilized using erosion and sedimentation control best management practices ~~measures~~ that achieve long term ~~long-term~~ erosion control. Ditches, swales, and other open stormwater channels must be sized ~~designed~~ to handle, at a minimum, the expected volume and rate of ~~run-off~~. Each channel should be constructed in sections so that the section's grading, shaping, and installation of the permanent lining can be completed the same day. If a channel's final grading or lining installation must be delayed, then diversion berms must be used to divert stormwater away from the channel, properly-spaced check dams must be installed in the channel to slow the water velocity, of runoff from a 10-year frequency storm. They must be stabilized with vegetation, riprap, or other non-erosive lining appropriate to the slope, soil, drainage condition and expected runoff velocity and a temporary lining installed along the channel to prevent scouring. Permanent stabilization ~~for of~~ channels is addressed under Appendix A(5)(g)A(6)(g) above.

NOTE: (1) The channel should receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or sideslopes. (2) When the watershed draining to a ditch or swale is less than 1 acre of total drainage and less than ¼ acre of impervious

area, diversion of runoff to adjacent wooded or otherwise vegetated buffer areas is encouraged where the opportunity exists.

- (8)(9) Roads.** Gravel and paved roads must be designed and constructed with crowns or other measures, such as water bars, to ensure that stormwater is delivered immediately to adjacent stable ditches, vegetated buffer areas, catch basin inlets, or street gutters.

NOTE: (1) Gravel and paved roads should be maintained so that they continue to conform to this standard in order to prevent erosion problems. (2) The department recommends that impervious surfaces, including roads, be designed and constructed so that stormwater is distributed in sheet flow to natural vegetated buffer areas wherever such areas are available. Road ditches should be designed so that stormwater is frequently (at least every 100 to 200 feet) discharged via ditch turnouts in sheet flow to adjacent natural buffer areas wherever possible.

- (9)(10) Culverts.** Culverts must be sized to avoid unintended flooding of upstream areas or frequent overtopping of roadways. Culvert inlets must be protected with appropriate materials for the expected entrance velocity, and protection must extend at least as high as the expected maximum elevation of storage behind the culvert. Culvert outlet design must incorporate measures, such as aprons or plunge pools, to prevent scour of the stream channel. Outlet protection measures must be designed to stay within the channel limits. The design must take account of tailwater depth.

- (10)(11) Parking areas.** Parking areas must be constructed to ensure runoff is delivered to adjacent swales, catch basins, curb gutters, or buffer areas without eroding areas downslope. The parking area's subbase compaction and grading must be done to ensure runoff is evenly distributed to adjacent buffers or side slopes. Catch basins must be located and set to provide enough storage headdepth at the inlet so to allow inflow of peak runoff rates without by-pass of runoff to other areas.

- (11) Stormwater channels.** Ditches, swales, and other open stormwater channels must be designed, constructed, and stabilized using erosion and sedimentation control best management practices that achieve long term erosion control. Ditches, swales and other open stormwater channels must be sized to handle, at a minimum, the expected volume and rate of runoff from a 10-year frequency storm. They must be stabilized with vegetation, riprap, or other non-erosive lining appropriate to the slope, soil, drainage condition and expected runoff velocity.

APPENDIX B. Inspection and maintenance

~~12/30/03~~

Section (1) applies to all projects

(1) During construction

- (a) **Inspection and maintenance.** Inspect disturbed and impervious areas, erosion and sedimentation control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. Do the inspections at least once a week before and after a storm event, and prior to completion of permanent stabilization. A person with knowledge of erosion and stormwater control, including the standards in this permit and any departmental companion document to this permit, must conduct the inspection. This person must be identified in the inspection log. If best management practices (BMPs) need to be modified or if additional BMPs are necessary, implementation must be completed within 7 calendar days and prior to any storm event (rainfall). All measures must be maintained in effective operating condition until areas are permanently stabilized.
- (b) **Inspection log (report).** Keep a log (report) summarizing the inspections. The log must include the name(s) and qualifications of the personnel making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicles access points to the parcel. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and location(s) where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken.

Sections (2) - (5) apply to all projects except those including 1 to 5 acres of disturbed area, and less than 20,000 sq. ft. of impervious area in the direct watershed of a waterbody most at risk or less than 1 acre of impervious area in other areas.

(2) After construction

- (a) **Maintenance plan.** Keep a plan for the inspection and maintenance of the site's stormwater management system and permanent erosion and sedimentation controls. The plan must be developed by a professional engineer or other professional knowledgeable with the specific design of the site's stormwater management measures and permanent erosion and sedimentation controls. At a minimum, the inspection and maintenance plan must include the following items.
 - (i) **List of facilities to be maintained.** List the stormwater management measures and erosion and sedimentation controls that are to be inspected and maintained (e.g. "parking lot catch basins").
 - (ii) **List of inspection and maintenance tasks.** List the inspection and maintenance tasks required for each stormwater management measure or erosion and sedimentation control (e.g. "remove accumulated sediments in basin sumps"). List the specific qualifications (if any) needed by the person performing each task (e.g. "a professional engineer must perform the inspection of the retention pond's embankment").

- (iii) **Task frequency.** Indicate the required frequency of performing each inspection or maintenance task (e.g. “annually in early spring”).
 - (iv) **Responsible party.** State the name, job title, employer, employer address, and phone number of the person responsible for ensuring that inspection and maintenance tasks are done.
 - (v) **Designer information.** Provide the names, job titles, employer addresses, and phone numbers of the engineers and other professionals who designed the site’s stormwater management measures and permanent erosion and sedimentation controls. This includes suppliers of proprietary stormwater management measures or proprietary erosion and sedimentation controls used on the site.
 - (vi) **Inspection and maintenance log.** Provide a maintenance log to record the inspections and maintenance performed on the site. Fill out the a maintenance log by giving the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed after their removal.
- (b) **Maintenance tasks.** The following areas, structures, and measures must be inspected and maintained. [The basic inspection and maintenance tasks are given for each.](#) Areas, structures, and measures other than those listed below may need inspection on the site. Inspection or maintenance tasks other than those discussed below developed may be included in the maintenance plan developed for the site.

~~Note:~~**NOTE:** Expanded and more-detailed descriptions for [many of these specific maintenance tasks](#) may be found in the Maine DEP’s *Stormwater Management for Maine: Best Management Practices*.

- (i) **Vegetated areas.** Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows. See permanent stabilization standards in Appendix A(5).
- (ii) **Stormwater channels.** Inspect ditches, swales and other open stormwater channels in the spring, in late fall, and after heavy rains to remove any obstructions to flow, remove accumulated sediments and debris, to control vegetated growth that could obstruct flow, and to repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation [attempting](#) growing [up](#) through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel’s bottom or sideslopes.

- (iii) **Culverts.** Inspect culverts in the spring, in late fall, and after heavy rains to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the culvert's inlet and outlet.
- (iv) **Catch-basin systems.** Inspect and, if required, clean-out catch basins at least once a year, preferably in early spring. Clean-out should include the removal and legal disposal of any accumulated sediments and debris at the bottom of the basin, at inlet any grates, at any inflow channels to the basin, and at any pipes between basins. If the basin outlet is designed to trap floatable materials, then remove the floating debris and any floating oils (using oil-absorptive pads).
- (v) **Roadways and parking surfaces.** Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader. Grading of gravel roads, or grading of the gravel shoulders of gravel or paved roads, must be routinely performed to ensure that stormwater drains immediately off the road surface to adjacent buffer areas or stable ditches, and is not impeded by accumulations of graded material on the road shoulder or by excavation of false ditches in the shoulder. If water bars or open-top culverts are used to divert runoff from road surfaces, clean-out any sediments within or at the outlet of these structures so to restore their function.
- (vi) **Buffers.** Inspect resource and treatment buffers at least once a year for evidence of erosion, concentrating flow, and encroachment by development. Management of a buffer's vegetation must be consistent with the requirements in any deed restrictions for the buffers. Wooded buffers must remain fully wooded and have no disturbance to the duff layer. Vegetation in non-wooded buffers must be cut no more than three times per year and no shorter than six inches. Erosion within a buffer must be repaired as soon as practicable. If flows are concentrating within the buffer, site grading, level spreaders, or ditch turn-outs must be used to ensure a more even distribution of flow into the buffer. Check downslope of all spreaders and turn-outs for erosion. If erosion is present, adjust or modify the spreader's or turnout's lip to ensure a better distribution of flow into the buffer. Clean-out any accumulation of sediment within the spreader bays or turn-out pools.
- (vii) **Stormwater detention and retention facilities.** Each detention basin or retention pond built for the control or treatment of stormwater must have a maintenance plan developed by the facility's design engineer. At a minimum, the maintenance must include [the tasks listed below](#).

[embankment inspection and maintenance, outlet inspection and clean-out, emergency](#)

~~[\(AA\) Embankment inspection and maintenance. Inspect the impoundment's embankments annually or after major storms to identify excessive settlement, slope erosion, internal piping, and downstream swamping. Evidence of any of these conditions must be reviewed by a professional engineer immediately. Mow the embankment at least annually to control the growth of woody vegetation.](#)~~

~~[\(BB\) Outlet inspection and clean-out. Inspect the impoundment's outlet control structure annually or after major storms to identify broken seals, obstructed orifices, and plugged trash racks. Remove and dispose of any sediments and debris within the control structure. Repair any damage to trash racks or debris guards as soon as practicable.](#)~~

~~(CC) Emergency spillway maintenance.~~ Complete yearly inspections of the impoundment's emergency spillway, if it has one. Maintenance must include the mowing of vegetated spillways to control woody vegetation and the replacement of any dislodged stone in riprap spillways.

~~(DD) Sediment~~ spillway maintenance, and sediment removal and disposal. ~~Provide for the occasional removal and disposal of accumulated sediments within the impoundment and the impoundment's forebay, if it has one. The clean-out frequency ranges from five to twenty years, depending on the sediment load to the pond or basin.~~

(viii) Runoff infiltration facilities. Each infiltration facility built for the control or treatment of stormwater must have a maintenance plan. The plan must be approved by the department for a project permitted under the Site Law. The maintenance plan must include ~~the tasks listed below.~~

~~(AA) Clean-out pretreatment measures.~~ Inspect and clean out any pre-treatment measures installed to limit the amount of sediment and hydrocarbons entering the infiltration measure. This must be done at least semi-annually to limit the wash-out of captured sediments and other pollutants to the infiltration measure during large storms.

~~(BB) Infiltration rehabilitation.~~ Rehabilitation of infiltration measures is generally necessary every three to ten years, depending on the soil conditions, infiltration surface treatment, and sediment load to the infiltration measure. Generally, renewal is necessary if the infiltration measure fails to drain within 72 hours after a rainfall of one half inch or more. For sod infiltration basins, rehabilitation can usually be accomplished through the tilling and replanting of the soil. Rock-lined basins or stone-filled trenches will usually require removal of the stone, replacement of any underlying filter fabric, and the tilling or removal of the underlying soil.

~~(CC) Sediment~~ clean-out pretreatment measures, Infiltration rehabilitation, and sediment removal and disposal. ~~Provide for the occasional removal and disposal of accumulated sediments within the infiltration area. The clean-out frequency ranges from two to ten years, depending on the sediment load to the infiltration measure.~~

(ix) Proprietary treatment devices. Contract with a third-party for the removal of accumulated sediments, oils, and debris within the device and the replacement of any absorptive filters. The frequency of sediment clean-out and filter replacements must be consistent with the unit's storage capacity and the estimated pollutant load from the contributing drainage area. This clean-out frequency is usually established by the manufacturer of the proprietary system when sizing the device for the project.

~~Note: Other practices and measures.~~ **NOTE:** Contact staff in the department's Division of Watershed Management for assistance developing inspection and maintenance requirements for other drainage control and runoff treatment measures installed on the site.

~~Note:~~**NOTE:** The maintenance needs for most measures may be found in the Maine DEP's *Stormwater Management for Maine: Best Management Practices*.

- (3) **Maintenance contract.** The applicant must demonstrate through submission of an executable contract with a qualified professional that maintenance will be performed as required.
- (4) **Certification. Maintenance certification.** Within three months of the expiration of each five-year interval from the date of issuance of the permit, the permittee shall certify the following the department.
- (a) **Identification and repair of erosion problems.** All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.
 - (b) **Inspection and repair of stormwater facilities.** All aspects of the stormwater quantity and quality control system have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the facilities.
 - (c) **Maintenance.** The erosion and stormwater maintenance plan for the site is being implemented as written, or modifications to the plan have been submitted to and approved by the department.
- (5) **Period**~~[moved from Section 4 of existing rule]~~. The permittee must maintain all components of the stormwater management system until it is formally accepted by the municipality or quasi-municipal district, or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system. The charter of such an association must be approved by the department. If a municipality or quasi-municipal district chooses to accept a stormwater management system, it must provide a letter to the department stating that it assumes responsibility for the system, and will maintain all components of the system in compliance with department standards. Upon such assumption of responsibility, and approval by the department, the municipality, quasi-municipal district, or association must comply with all terms and conditions of the permit.
- ~~(5)~~(6) **Additional requirements.** Additional requirements may be applied on a site-specific basis.

APPENDIX C. Housekeeping

~~12/30/03~~

These performance standards apply to all sites.

- (1) **Spill prevention.** Controls must be used to prevent pollutants from construction and waste materials stored on-site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.
- (2) **Groundwater protection.** During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.

NOTE: Lack of appropriate pollutant removal best management practices (BMPs) may result in violations of the groundwater quality standard established by 38 M.R.S.A. §465-C(1). Any project proposing infiltration of stormwater must provide adequate pre-treatment of stormwater prior to discharge of stormwater to the infiltration area, or provide for treatment within the infiltration area, in order to prevent the accumulation of fines, reduction in infiltration rate, and consequent flooding and destabilization. Many pollutants found in stormwater accumulate in the soils in infiltration areas and are released due to chemical changes that occur in the infiltration area over time. Consequently, runoff quality often underestimates the long-term adverse effects on groundwater quality due to these contaminants, and cannot be used as a direct indicator of anticipated adverse effects. Maintenance of the infiltration area to prevent clogging by fine sediments or accumulation of organic matter, and to prevent development of anaerobic conditions, or other conditions that could increase the risk of pollutant discharge from the infiltration area, may be necessary.

- (3) **Fugitive sediment and dust.** Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control.

Examples of BMPS -- Operations during wet months, that experience tracking of mud off the construction site onto public roads, should provide for sweeping of road areas at least once a week and prior to significant storm events. Where chronic mud tracking occurs, a stabilized construction entrance should be provided. Operations during dry months, that experience fugitive dust problems, should wet down the access roads once a week or more frequently if needed.

NOTE: Dewatering a stream without a permit from the department violates state water quality standards and the Natural Resources Protection Act.

- (4) **Debris and other materials.** Litter, construction debris, and construction chemicals exposed to stormwater must be prevented from becoming a pollutant source.

NOTE: Construction activities are required to comply with applicable provision of rules related to solid, universal, and hazardous waste:

Maine solid waste and hazardous waste management rules;
Maine hazardous waste management rules;
Maine oil conveyance and storage rules; and
Maine pesticide requirements.

- (5) Trench or foundation de-watering.** Trench de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water must be removed from the ponded area, either through gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site.

Alternatively, pumped discharges may be located so that "silt sacks" or equivalent products will remove much of the coarser sediments. Fine sediments are additionally reduced by the necessary downgradient buffer areas. An enclosure of an appropriate sediment barrier may be necessary also to clean polluted flow from de-watering.

NOTE: For guidance on de-watering controls, consult the Maine Department of Transportation's (MDOT's) *Best Management Practices for Erosion and Sedimentation Control*.

- (6) Non-stormwater discharges.** Identify and prevent contamination by non-stormwater discharges.
- (7) Additional requirements.** Additional requirements may be applied on a site-specific basis.

APPENDIX D. Standards for infiltration basins, dry wells, and subsurface fluid distribution systems (Section 413 License by Rule Standards)

Provided that the standards in this appendix are~~12/30/03~~

~~A wastemet, a discharge permit for infiltration to groundwater~~ from a stormwater infiltration system is considered a de minimus discharge for the purposes of the Waste Discharge Licensing Program, and does not require an individual waste discharge license if the license by rule standards in this appendix are met. ~~Appendix D is adopted pursuant to 38 M.R.S.A. § 413. The following definitions apply to this appendix, rather than the definitions in license.. However, nothing in this chapter may be construed to limit the Department's Section 2 of this chapter, licensing or enforcement authority under 38 M.R.S.A. §413 or 38 M.R.S.A. Article 4-A. An infiltration system serving a development regulated under the Site Location of Development Act may be required to meet additional standards.~~ For definitions and provisions associated with the Waste Discharge program, see 38 M.R.S.A. §§ 413 et. seq., and for chapters concerning waste discharge licensing, see generally chapters 520 et. seq. et seq., and Department Rules chapters 520 et seq.

All drywells and subsurface fluid distribution systems must be registered with and meet all other requirements of the Department's Underground Injection Control Program.

~~Note~~Note to reviewers -- the department does not currently have statutory authority to allow "license by rule" for stormwater infiltration, but will be seeking such authority from the Legislature in the upcoming session.]

~~(+)(1)~~ **Definitions.** As used in Appendix D, this appendix, the following terms have the following meanings.

- (a) **Dry-weather discharges.** Any discharge to a stormwater management system that is not composed entirely of stormwater, other than discharges directly resulting from fire-fighting activities at the facility. Dry-weather discharges can originate from direct connections to the stormwater management system from industrial, commercial, or residential facilities, or indirectly as surface or subsurface discharges to the stormwater collection system.
- (b) **Drywell.** A well or other facility deeper than it is wide, completed above the water table so that its bottom and sides are typically dry except when receiving fluids.
- (c) **Infiltration.** Any process specifically used to meet all or part of the stormwater quality or quantity and quality standards of this rule by actively directing all or part of the stormwater into the soil. infiltration ~~Infiltration~~ is the process by which runoff percolates through the unsaturated overburden and fractured bedrock to the water table. For the purposes of this rule, infiltration ~~Infiltration~~ does not include:
 - (1) Incidental wetting of soil in ditches, detention basins or the equivalent;
 - (2) Wetting of underdrained basins, dry swales, or similar filtration systems, provided that they discharge to surface waters or to a buffer strip; and
 - (3) Wetting of buffers meeting department requirements for use as stormwater quality treatment or stormwater quantity control.

~~Discharge~~However, discharge of runoff to areas of the site where the water will collect and percolate into the ground is considered infiltration if the volume, rate, or quality of the discharge exceeds the runoff treatment capacity of the area requirements for quality or quantity treatment buffersarea, as determined by the department. Underground swales, underdrained ponds, and similar practices that discharge to surface waters or to buffer strips meeting department requirements for quality or quantity treatment buffers are not considered infiltration systems, although these may be used to treat runoff prior to discharge to an infiltration area.

(d) **Infiltration ~~(retention)~~ basin.** ~~A basin or other facility~~**basin.** A structure wider than it is deep and designed to hold runoff without any means of discharge other than evapotranspiration, infiltration, or emergency bypass.

(e) **Public water supply.** Any publicly- or privately-owned water supply~~water-supply~~ system that serves at least 25 people or 15 service connections for at least 60 days per year.

~~(f)~~**Surface irrigation.** ~~Application of wastewater to the land by means of sprinklers, nozzles, holes in piping, or similar means, including drip irrigation.~~

~~(g)~~**Subsurface fluid distribution system.** Any system designed to dispose of stormwater beneath the surface of the earth, including, but not limited to, wells, settling tanks, disposal fields, pretreatment filters, pipes, or any other fixture, mechanism, or apparatus used for this purpose.

~~(h)~~**(g) Zone of contribution or delineated contributing area.** The projection of the three-dimensional volume of water flowing to a discharging well onto a two-dimensional map view.

(2) ~~(2)~~**Sources of runoff acceptable and not acceptable for infiltration**

~~(a)~~**Storage or handling of petroleum products, pesticides, fertilizers, and hazardous substances.** Infiltration of runoff from subwatersheds of an activity in which petroleum products, pesticides, fertilizers, hazardous substances, or other materials with the potential to contaminate groundwater are stored or handled, is not allowed.

allowed. This does not

(a) See (3)(k) concerning the potential use of containment structures apply to storage of heating oil in a tank or tanks with a total volume of 550 gallons or less and serving a single consumptive residential or commercial user.

(b) **Storage or handling of road salt or similar materials.** Infiltration of runoff from subwatersheds of an activity in which road salt or similar materials are stored or handled in bulk is not allowed.

(c) **Containment structures.** Storage and handling areas for petroleum products, road salt, and other potential groundwater contaminants may be isolated within containment structures, buildings, or other enclosures to effectively remove those areas from subwatersheds, so that infiltration structures may be constructed to serve the remaining areas of the subwatershed, provided that the facility is operated in accordance with a Spill Prevention, Control, and Countermeasures Plan, Operation and Maintenance Plan, or equivalent document approved by the Department.

- (d) ~~(e)~~ **Infiltration of runoff from asphalt or concrete paving or equivalent material.** Infiltration of runoff from a total of one acre or more of asphalt or concrete paving or equivalent material at a given project is not allowed except by means of infiltration basins as described under the design criteria below. This limitation does not apply to roads entirely within subdivisions consisting of lots for single-family detached residential housing or to use of porous pavement. Use of porous pavement is limited by subsections 2(a) and 2(b), and other requirements of this chapter.
- (e) ~~(d)~~ **Infiltration of runoff from lawn areas, vegetated areas, and roofs.** Infiltration of runoff from lawn areas and other vegetated areas, playing fields, and roofs of residential and commercial structures where no manufacturing or processing occurs, other than for-home-based industries, is allowed, provided that any application of fertilizers, pesticides, and similar turf-management chemicals, is in accordance with a Department approved management plan and no part of the areas used for infiltration is in the delineated contributing area of a well that is part of a public water supply system. Lawn areas of five acres or less on individual lots that are sold or developed as part of a residential subdivision consisting of lots for single-family detached residential housing are exempt from this requirement.

(f) Typical land uses and activities for which infiltration may be acceptable. Typical land uses and activities for which infiltration may be acceptable include, but are not limited to, the following:

- (1) Residential streets and rural highways;
- (2) Single-family residential development;
- (3) Institutional development, except for parking areas;
- (4) Office developments, except for parking areas;
- (5) Non-industrial rooftops; and
- (6) Pervious areas.

(g) Typical land uses and activities for which infiltration is not acceptable. Typical land uses and activities for which infiltration is not acceptable include, but are not limited to, the following:

- (1) Vehicle storage, fueling, cleaning, or service and maintenance areas;
- (2) Commercial or other large parking lots, such as those at fast-food restaurants, factories, convenience stores, high-turnover (chain) restaurants, shopping centers, and supermarkets;
- (3) Road-salt and sand – salt storage and loading areas (if exposed to rainfall);
- (4) Rooftops of industrial facilities;
- (5) Outdoor storage and loading/unloading areas of hazardous substance generators (if materials or containers are exposed to rainfall); and
- (6) Marinas (service, repainting, and hull maintenance areas).

(3) Location

- (a) Water supply wells.** Unless specifically approved by the Department and the Department of Human Services' Drinking Water Program, if applicable, infiltration systems may be located no less than 300 feet from any private water supply well and may not be located within the delineated contributing area of a public water supply well. Department approval of a reduced setback will be subsequent to review and approval of a study by a Maine Certified Geologist demonstrating that discharges from the infiltration system will not be within the zone of contribution of the well or wells. Infiltration systems should be located as far downgradient of any water supply well as practical.

~~(g)(b) Setback from subsurface wastewater disposal system. Infiltration systemssystems. An infiltration system~~ should be considered a major watercourse for the purposes of Table 700.2 of the Maine Subsurface Wastewater Disposal Rules, 144A CMR 241, for determining applicable setbacks from the relevant components of a subsurface wastewater disposal system. Additional setback distances may be required by the Local Plumbing Inspector or the Department of Human Services' Division of Health Engineering. Infiltration systems should be located as far downgradient of any component of a subsurface wastewater disposal system as practical.

~~(g)(c) Setback from protectedProtected~~ natural resources. Infiltration systems ~~mayshall~~ be located no less than 25 feet from any protected natural ~~resource.resources as defined at 38 M.R.S.A as defined at 38 M.R.S.A §480-B,~~ other than fragile mountain areas, ~~§480-B.~~ ~~Infiltration systems shouldand shall~~ be located as far upgradient of any such resources as practical.

~~(h) Areas with less than five feet of saturated overburden above the bedrock surface. Infiltration systems serving any activity with a total of one acre or more of impervious area may not be located in areas with less than five feet of saturated overburden above the bedrock surface, as measured during the seasonal low water table. This limit does not apply to runoff draining entirely from areas of non-asphalt roofing, where no manufacturing or processing occurs, other than for home-based industries. Blast rock or similar material is to be considered as overburden and not as bedrock. Separation from bedrock and depth to the water table at any project may be demonstrated by means of test pits, borings, or similar invasive explorations, or by non-invasive geophysical methods such as seismic surveys. Demonstration of a continuous in situ layer, at least five feet in thickness, of unfractured basal till or marine, estuarine, or lacustrine clay between bedrock and the unit into which stormwater is to be infiltrated may substitute for this requirement, at the discretion of the Department. Infiltration systems discharging to blast rock or similar highly permeable fill, or to units underlain by low permeability materials such as basal till or marine, estuarine, or lacustrine clay, should assess the potential adverse impacts of seepage as required in paragraph 3(b), below.~~

(3) Design and operation

~~(a)Permeability of the soil. The permeability of the soil at the depth of the base of the proposed infiltration system must be no less than 0.5 inches per hour, and no greater than 2.41 inches per hour. Imported or manufactured soils or other materials, such as compost, as specifically approved by the Department, may be installed at the base and sides of the proposed infiltration system to reduce the permeability to no greater than 2.41 inches per hour if necessary. This layer must be at least six inches in thickness, measured perpendicular to the closest part of the infiltration system. Permeability must be shown to be reasonably consistent across the proposed infiltration area and may be determined by in place well or permeameter testing, by analyses of soil gradation, or other means acceptable to the Department.~~

~~(b)Stability of slopes. Mounding of stormwater on clay, bedrock, or other low permeability surfaces as a result of stormwater infiltration may not create seepage or pore pressures that adversely affect the stability of slopes in the vicinity of the activity. A qualified professional must assess the potential for seepage erosion or other adverse effects on slope stability, and must submit a report of findings, including test borings or other subsurface explorations, modeling, or other means of analysis as determined to be necessary and applicable.~~

~~(e)(d)~~ **Pre-construction surface****Surface grade.** The pre-construction surface grade should be 20% or less at the location of the proposed infiltration system.

(c) Separation from bedrock. Infiltration systems serving one acre or more of impervious area shall be located in areas with more than five feet of saturated overburden above the bedrock surface, as measured during the seasonal low water table. This restriction does not apply to runoff from areas of non-asphalt roofing on structures in which no manufacturing or processing occurs, other than for home-based industries. Separation from bedrock and depth to the water table may be demonstrated by means of test pits, borings, or similar invasive explorations, or by non-invasive geophysical methods such as seismic surveys. Blast rock or similar material is considered as overburden and not as ~~Bottom of~~ bedrock. Demonstration of a continuous in-situ layer, at least five feet in thickness, of unfractured basal till or marine, estuarine, or lacustrine clay between bedrock and the infiltration structure may substitute for this requirement, at the discretion of the Department. Infiltration systems discharging to blast rock or similar highly permeable fill, or to units underlain by low-permeability materials such as basal till or marine, estuarine, or lacustrine clay, should assess the potential adverse impacts of seepage as required in paragraph 4(f), below.

(4) Design and operation

(a) Soil permeability. The permeability of the soil at the depth of the base of the proposed infiltration system must be no less than 0.5 inches per hour, and no greater than 2.41 inches per hour. Permeability must be shown to be reasonably consistent across the proposed infiltration area and may be determined by in-place well or permeameter testing, by analyses of soil gradation, or other means acceptable to the Department. Imported or manufactured soils or other materials (such as compost), as specifically approved by the Department, may be installed at the base and sides of the proposed infiltration system to obtain this range of permeability and provide additional treatment. This layer must be at least six inches in thickness, of which the bottom three inches are to be tilled into the native soil.

~~(d)(b)~~ **Vegetation of infiltration basins.** All areas of the basin not covered by stone or other non-vegetative covers must be maintained as grass.

~~(c)~~ **system—Separation from seasonal high water table.** The bottom of the infiltration system, including any stone layer or other material below the depth of any manufactured components of the system, must be at least three feet above the elevation of the seasonal high water table.

~~(e)(d)~~ **Drainage time—Time for drainage.** The infiltration system must be designed to drain completely within 72 hours following the runoff event.

(c) Impact on depth to groundwater. Infiltration of stormwater may not increase the elevation to the seasonal high water table beneath a surface-irrigation site, land-disposal area for septage or other waste, or other waste management or wastewater management facility, without specific approval by the Department and, if applicable, the Department of Human Services, without specific approval by the Department.

(f) Impact on groundwater flow. Stormwater infiltration may not affect the direction of groundwater flows so as to impair any groundwater monitoring programs or cause the migration of existing contaminated groundwater that would result in unreasonable adverse impact the on the quality of surface water, groundwater, or drinking water supplies.

- (g) Mounding and seepage.** Groundwater mounding due to stormwater infiltration, especially on clay, bedrock, or other low-permeability surfaces, or stormwater discharges to highly permeable materials such as gravel or blast rock, may not cause seepage, high pore-pressures, or other effects that will adversely affect the stability of slopes in the vicinity of the activity. A qualified professional must assess the potential for seepage and reduction in slope stability, and submit a report of findings, including logs of test borings or other subsurface explorations, modeling, or other means of analysis as determined to be necessary and applicable.
- (h) Conveyance of overflow.** Infiltration systems must include measures to convey overflow to a stable discharge location.
- (i) Control of access.** Access to any infiltration area must be controlled during and after construction to prevent compaction of the soil.
- ~~**(h)(j) Geotextile fabric between stone and soil layers. Geotextile.**~~ A geotextile fabric with suitable characteristics must be placed between any stone layer and adjacent soil.
- ~~**(i)(k) Features to minimize discharge of sediment. Grassed Sediment discharge to infiltration structures.**~~ Grassed swales, undersdrained swales, sediment traps, and other features other, similar practices must be incorporated in the design to minimize discharge of sediment to the infiltration system. The bottom and sides of infiltration basins must be covered by at least six inches of loam, of which the bottom three inches are to be tilled into the native
- ~~**(j)**~~ soil. All areas of the basin not required to be covered by stone or other non-vegetative material in order resist erosion must be maintained as grass.
- ~~**(j)(l)**~~ **Devices to trap petroleum products.** Dry wells or subsurface fluid distribution systems receiving runoff from small areas of asphalt or concrete paving and not prohibited from using infiltration under 2(C)Section 2 must include sump skimmers, sorbent booms, or similar devices providing to remove petroleum products from runoff. These devices must provide enough sorption capacity to effectively trap petroleum products from the anticipated flows. These devices must be in place for at least the first six months of operation, and for at least six months after construction and after any repaving or reconstruction. See also paragraph 5(d), below.
- ~~**(k) Containment structures.**~~ Storage and handling areas for petroleum products, road salt, and other potential groundwater contaminants may be isolated within containment structures, buildings, or other enclosures to effectively remove those areas from subwatersheds, so that infiltration structures may be constructed to serve the remaining areas of the subwatershed, provided that the facility is operated in accordance with a Spill Prevention, Control, and Countermeasures Plan, Operation and Maintenance Plan, or equivalent document approved by the Department.
- ~~**(l) Monitoring.**~~ Groundwater quality monitoring may be required as determined to be necessary by the Department, in order to demonstrate that the infiltration system will operate in compliance with the Water Classification Program. Groundwater quality monitoring will generally be required for activities infiltrating water from areas of heavy turf chemical use, such as golf courses and certain athletic fields, and large connected impervious areas, such as parking lots and runways. Groundwater quality monitoring will generally not be required for activities infiltrating water from lawn areas and other vegetated areas, residential developments except for those subwatersheds with large parking areas, playing fields, low use roads such as residential subdivision roads, and roofs of residential and commercial structures.

(m) Dry-weather discharges, and stormwater from outside drainage systems. Dry-weather discharges and stormwater from drainage systems outside the area of the activity may must not be discharged to an infiltration system, unless specifically approved by the Department.

~~**(n) Impact on groundwater flow.** Stormwater infiltration may not adversely affect the direction of groundwater flow so as to impair the operation of groundwater monitoring programs or cause migration of existing contaminated groundwater that would result in an unreasonable adverse impact on the quality of surface water, groundwater, or drinking water supplies.~~

~~**(o) Impact on depth to groundwater in area used for waste management.** Infiltration of stormwater may not reduce the depth to the seasonal high water table beneath a surface irrigation site, land disposal area for septage or other waste, or other waste or wastewater management facility, without specific approval by the Department and, if applicable, the Department of Human Services.~~

(4) Maintenance(5) Maintenance

~~**(a)(a) Snow storage prohibited.** With the exception of areas of porous pavement, the infiltration area may not be used for storage of snow.~~ Snow removed from any on-site or off-site areas must not be stored over an infiltration area, with the exception of porous pavement.

~~**(b) Observation wells, access points, gauges or rods, and expected rate of drainage.** Any subsurface fluid distribution system must have at least one observation well to determine how quickly the system drains after a storm, and access points to allow for inspection and removal of accumulated sediment from the infiltration system and any sediment traps. Dry wells and infiltration basins must have staff gauges, marked rods, or similar instrumentation to measure the accumulation of sediment and determine how quickly the system drains after a storm. The maintenance plan for the infiltration system must indicate the expected rate of drainage of the system and provide for removal of sediment.~~ **Groundwater monitoring.** Groundwater quality monitoring may be required by the Department to demonstrate that the infiltration system will operate in compliance with the Water Classification Program. Groundwater quality monitoring will generally be required for activities infiltrating water from areas of heavy turf-chemical use, such as golf courses and certain athletic fields, and large connected impervious areas, such as parking lots and runways. Groundwater quality monitoring will generally not be required for activities infiltrating water from lawn areas and other vegetated areas, residential developments except for those with large parking areas, playing fields, low-use roads such as residential subdivision roads, and roofs of residential and commercial structures.

(c) Pollution-control devices. Pollution-control devices such as oil – water separators, skimmers, and booms must be inspected regularly to determine if they need to be cleaned or replaced.

(d) Observation wells, measure of sediment accumulation, and points of access for sediment removal. Observation wells to determine the system's performance and access points to allow for the removal of accumulated sediment must be included in the design of subsurface fluid distribution systems. Dry wells and infiltration basins must have staff gauges, marked rods, or similar instrumentation to measure the accumulation of sediment and determine how quickly the system drains after a storm. The maintenance plan for the infiltration system must indicate the expected rate of drainage of the system and provide for removal of sediment.

(d)(e) Sediment removal and ~~rehabilitation or replacement of system.~~ maintenance of system performance. Sediment must be removed from the system to prevent deterioration of system performance. The system must be rehabilitated or replaced if its performance is degraded to the point that applicable stormwater quantity or quality standards are not met.

Note:~~NOTE:~~ Stormwater infiltration systems not meeting the standards above may require an individual waste discharge permit. Nothing in this chapter may be construed to limit the Department's authority under 38 M.R.S.A. §413 or 38 M.R.S.A. Article 4-A. An infiltration system serving a development regulated under the Site Location of Development Act may be required to meet additional standards. All drywells and subsurface fluid distribution systems must be registered with and meet all other requirements of the Department's Underground Injection Control Program.

APPENDIX E. Stormwater basins and ponds

[12/30/03](#)

Additional requirements may be applied on a site-specific basis.

This appendix outlines the basic criteria for siting, designing, and constructing detention basins and ponds used for meeting the department's stormwater management rules. Additional requirements will need to be met by the design engineer regarding geotechnical, hydrologic, structural, hydraulic, and construction concerns. This includes the requirement that the designer assess the impoundment's hazard potential for determining the appropriate design storm for the impoundment. This design storm may have a greater rainfall depth and larger recurrence interval than the 25-year, 24-hour storm used for the department's stormwater management program.

- (1) **Basin and pond types.** A variety of stormwater management basins and ponds are used to control runoff quantity and improve runoff quality from developments. All need professional siting and design to avoid unreasonable impacts to wetlands, surface waters, and groundwater and to ensure long-term stability, pollutant removal performance, and control of peak flow rates. General restrictions and requirements for all basins and ponds are provided below.

NOTE: Specific siting and design criteria for each type of structure can be found in the department's manual "Stormwater Management for Maine: Best Management Practices".

- (2) ~~(2)~~ **Siting restrictions.** The department has placed the following restrictions on the siting of stormwater basins and ponds. Other restrictions may apply based on drainage, geotechnical, wildlife, and safety concerns.
- (a) **Rivers, streams and brooks.** A basin or pond may not be located within or adjacent to a river, stream, or brook (intermittent or perennial) unless approved by the department pursuant to, or exempted from, the Natural Resources Protection Act. Act (NRPA). For the purposed of this appendix, "adjacent to" is defined as in Chapter 305, Section 2(D)(2).
- (b) **Wetlands.** A basin or pond may not be constructed within or adjacent to a wetland and no dam, wall, berm, or embankment may be placed within or adjacent a wetland as part of a stormwater management system, so that it requires approval pursuant to the Natural Resources Protection Act (NRPA) NRPA as determined by the department, unless approved by the department pursuant to NRPA. The use of natural wetlands for runoff detention or retention storage in order to meet the flooding standard or water quality standard, resource protection, phosphorus, or other protection standards is prohibited unless the quantity flooding standards in Section 5(B)(8)4(D) are met and a Natural Resources Protection Act permit is obtained, if required.
- (c) **Discharge of flows.** Concentrated flows from stormwater basins and ponds may not be discharged to an off-site area that has not received concentrated flows before. When detention is used on a site, the pre-construction flow condition to off-site areas, whether sheet or concentrated, must be maintained in the post-construction condition unless drainage easements are obtained from affected property owners.
- ~~(d)~~ **Underground(d) Underground detention.** Where underground detention is necessary due to required because of limited space or other restrictions, runoff must be treated to remove at least

50% of the total suspended solids at least a low level of stormwater treatment prior to the runoff's discharge to the underground storage facility. The department may require runoff treatment to remove other pollutants if it determines that underground storage poses a threat to groundwater quality. The outlet control structure and the storage chambers for the underground detention structure must be accessible from the surface for maintenance, debris removal, and, if necessary, future modification.

(3) Design requirements

- (a) ~~Primary outlet structures. Principal spillways.~~ Those basins and ponds designed to control flows so to meet the flooding standard must have outlets principal spillways capable of controlling runoff from 24-hour storms of the 2-year, 10-year, and 25-year frequencies. Those basins and ponds designed to provide channel protection detention must have outlets principal spillways capable of providing extended detention of twelve hours for runoff from a 24-hour storm with a 1-year frequency. Extended detention shall mean the average detention time of runoff entering the pond using the plug flow method is twelve hours. Basin and pond outlets must have the design features listed below of a one-year frequency. In both cases, the principal spillway must control the maximum flows from the design storm(s) without activating the emergency spillway.

~~(i) Trash racks. All pipes, culverts, and orifices must have trash racks.~~ (i) Trash racks. Any pipe, orifice, or culvert serving as a basin's or pond's outlet must have a trash rack to control clogging by debris and to provide safety to the public. The surface area of ~~the each~~ rack must be at least four times the outlet opening ~~area. Larger it is protecting. Significantly larger trash~~ rack areas may be required for openings less than twenty-four smaller orifices in diameter. The spacing between rack bars must be four no more than six inches or one-half the smallest dimension of the smallest outlet opening, opening behind it, whichever is smaller-less. If possible, trash racks should be inclined so to be self-cleaning.

(ii) **Seepage controls.** All smooth outlet pipes greater than eight inches and all corrugated outlet pipes greater than 12 inches must have seepage controls to prevent the piping of soil along the outside of the pipe. This standard applies to both dry detention basins and ponds with permanent pools.

(iii) **Anti-floatation design.** All outlets employing a riser structure must be designed to prevent the riser floating during the detention or retention runoff.

- (b) **Emergency spillways.** Each stormwater basin and pond must have an emergency spillway designed to independently convey the routed runoff from at least the 25-year, 24-hour storm while maintaining at least one foot of freeboard between the peak storage elevation and the top of the embankment crest. All spillways must meet the following criteria.

(i) **Location.** Emergency spillways must be located on undisturbed, non-fill soil wherever possible. If the spillway must be located on fill soils, then the spillway must be horizontally offset at least 20 feet from the principal outlet and be designed with a riprap lining, reinforced-turf lining, or a non-flexible lining.

(ii) **Exit channel grade.** The maximum grade of the spillway's exit channel must not exceed 20% unless a non-flexible lining is used to control erosion within the channel. Vegetation, reinforced turf, riprap, and modular blocks are considered flexible linings. All linings must be evaluated for stability at the channel grade chosen.

(iii) Flow depth. The design flow depth in the exit channel may not exceed one-half the d50 stone size for channels lined with riprap. The design flow depth in the exit channel may not exceed three inches for channels lined with un-reinforced vegetation.

(c) Embankments. Basin and pond embankments must be designed by a professional engineer. The design must include a geotechnical investigation of the subsurface conditions at the proposed embankment location to evaluate settlement potential, groundwater impacts, and the need for seepage controls, to design for the effects of settlement, and to consider the effects of groundwater. controls. The department will require the submittal of a geotechnical report from a geotechnical engineer for any embankment over 10 feet in effective height or posing a significant hazard to downstream property or life.

NOTE: [reference to manual to be added]

~~**(i) Crest Elevation.**~~**(i) Crest elevation.** The minimum elevation of the top of the settled embankment must be at least one foot above the peak water surface in the basin with the emergency spillway flowing at design depth for a 25-year, 24-hour stormthe design storm routed through just the emergency spillway.

(ii) Crest width. The minimum crest width for any embankment must be as shown in the following table:

Effective height of embankment (feet)	Crest Width (feet)
less than 10	6
10 - 15	8
15 - 20	10
20 - 25	12
25 - 35	14
more than 35	15

(iii) Construction. The selection of fill materials shall be subject to approval of the design engineer or inspecting engineer. Fill shall be free of frozen soil, rocks over six inches, and sod, brush, stumps, tree roots, wood, or other perishable materials. Embankment fills less than 10 feet in fill height must be compacted using compaction methods that ~~(ii)~~ **Construction** would reasonably guarantee that the fill density is at least 90% of the maximum density as determined by standard proctor (ASTM-698). All embankment fills more than 10 feet in fill height must be compacted to at least 90% of the maximum density as determined by standard proctor ~~(ASTM-D-698).~~ (ASTM-698) and must have their density verified by field density testing.

~~**(iii)**~~**(iv) Slopes.** The embankment's slopes may not be steeper than 3 horizontal to one vertical.

(d) Underdrain outlets. Those basins and ponds designed to provide channel protection filtering must have underdrains meeting the following criteria.

- (i) Location and layout.** *[to be developed]*
- (ii) Pipe material.** *[to be developed]*
- (iii) Pipe installation.** *[to be developed]*
- (iv) Filter media.** *[to be developed]*
- (v) Vegetation.** *[to be developed]*

APPENDIX F. Buffers *[May be further changes after John Simons' work is received.]*

[12/30/03](#)

Additional requirements may be applied on a site-specific basis.

(1) Buffers. A buffer is a vegetated, non-lawn area or areas located down-gradient from a project that serves to store and remove pollutants from stormwater runoff flowing from a project. Buffers may not be interrupted by intermittent stream channels or other drainage ways and must have a relatively uniform slope so that stormwater does not become concentrated in channels.

(a) Type. There are two basic types of buffers: wooded and non-wooded.

(i) Wooded buffer. A wooded buffer is a buffer that is covered by a canopy of trees and other woody vegetation, and that has an undisturbed organic duff layer. A wooded buffer is also a buffer that is planted, or allowed to revert, to such a condition.

(ii) Non-wooded buffer. A non-wooded buffer is a buffer that is covered with a dense, uninterrupted cover of grassy vegetation. It does not include lawn areas. The buffer may not be mown [more](#) than three times per year or mown to a height [of](#) less than 6 inches. Buffers that include a mixture of wooded and non-wooded areas are considered non-wooded.

(b) Size and slope. Buffer width is measured along the direction of flow through the buffer. Only continuous width may be counted when calculating buffer width. The area draining to the buffer may never exceed four times the effective area of the buffer. The buffer's slope may not exceed 15% [to be included in the calculation of buffer width](#).

(c) Flow entering the buffer. The stormwater runoff must enter the buffer in unchannelized sheet flow. The site must be graded so that runoff is not concentrated within the developed portion of the site, and sheets uniformly off the edge of the developed area into the adjacent buffer, unless site topography and the relative location of the buffer require that runoff be collected and directed to the buffer in channelized flow. In this case, channelized runoff must be distributed evenly along a contour at the uphill edge of the buffer by means of a level spreader.

[Considering further revision to the following 2 definitions \(ex. combine common elements\).](#)

[\(d\) Level spreaders used for stormwater quality control.](#) [The contributing drainage area to a level spreader used to spread runoff into treatment buffers may not exceed 400 square feet per linear foot of level spreader. \(d\) Level spreader for quality control. A level spreader is a trench and berm system, built along a contour that spreads runoff out in even, sheet flow to a stable, down-gradient area. Since a level spreader's lip needs to be kept reasonably level so to spread flow properly, the department. Each level spreader must be sized so that its contributing drainage area does not exceed 400 sq. ft. per linear foot of level spreader.](#)

[The](#) length of any single spreader may not exceed 25 feet, unless otherwise approved by the [department](#).

(e) Level spreaders [used](#) for stormwater quantity control. [The stormwater flow rate to each contributing drainage area to a level spreader used simply to convert channel flow to sheet flow may not exceed 0.10 acre per foot length of level spreader. The peak flow rate to this type](#)

of level spreader due to a 10-year, 24-hour storm must be less than 0.25 cubic feet per second (0.25 cfs) per foot of length of level spreader to accommodate the flow from a 10-year, 24-hour storm. The maximum drainage area to a level spreader. The maximum length of any single spreader may not exceed 0.125 acre per foot length of level spreader. The minimum length of each level spreader must be 12 feet. The maximum length of each level spreader must be 25 feet, unless otherwise approved by the department.
25 feet, unless otherwise approved by the department.

- (f) **Wetland Buffers.** In addition to the conditions listed under sections A through D above, the following restrictions apply to wetlands used as buffers: there must be no open water in the wetland anytime of year, there must be no open water connection from the wetland to another water body, the seasonal high groundwater table in the wetland must not be at or above the ground surface, and the wetland must not provide habitat for a threatened or endangered species. Final approval of using a wetland as a runoff buffer may also be dependent on approval from the Army Corps of Engineers or the department through a Natural Resources Protection Act permit.
- (2) **Covenants and restrictions.** Buffer areas for activities must be made subject to covenants and restrictions as provided below, unless otherwise approved by the department. The department may approve or allow alternative language if the department determines that the alternative language will be at least as protective as the language provided below. If the department approves use of a conservation easement, the easement must include restrictions at least as protective as those described below.

(a) Wooded buffer, limited disturbance

DECLARATION OF RESTRICTIONS

(Wooded Buffer, Limited Disturbance)

THIS DECLARATION OF RESTRICTIONS is made this _____ day of _____,
19____,20____, by _____ , _____ ,
 _____ (name) _____ (street address)
 _____ County, Maine, _____, (herein referred to as the
 _____ (city or town) _____ (county) _____ (zipcode)
 "Declarant"), pursuant to a permit received from the Maine Department of Environmental Protection
 under the Stormwater Management Law, to preserve a buffer area on a parcel of land near
 _____ ,
 _____ (road name) _____ (known feature and/or town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(town)
described in a deed from _____ to _____ dated _____
(name) (name of Declarant)
_____, 19____20____, and recorded in Book _____ Page _____ at the
_____ County Registry of Deeds, herein referred to as the "property"; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows: (Note: Insert description of restricted buffer area location here)

WHEREAS, pursuant to the Stormwater Management Law, 38 M.R.S.A. Section 420-D and Chapter 500 of rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"), Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1. **Restrictions on Restricted Buffer Area.** Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must

remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.

a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material may be placed, stored or dumped on the Restricted Buffer Area, nor may the topography of the area be altered or manipulated in any way;

b. Any removal of trees or other vegetation within the Restricted Buffer Area must be limited to the following:

(1) No purposefully cleared openings may be created and an evenly distributed stand of trees and other vegetation must be maintained. An "evenly distributed stand of trees and other vegetation" is defined as maintaining a minimum rating score of 12 points in any 25 foot by 25 foot square (625 square feet) area, as determined by the following rating scheme:

Diameter of tree at 4½ feet above ground level	Points
2 - 4 inches	1
4 - 12 inches	2
>12 inches	4

Where existing trees and other vegetation result in a rating score less than 12 points, no trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained;

(2) No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;

c. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence;

d. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area;

e. Any level spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDE. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. Enforcement. The MDEP may enforce any of the Restrictions set forth in Section 1 above.

3. Binding Effect. The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.

4. Amendment. Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.

5. Effective Provisions of Declaration. Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.

6. Severability. Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.

7. Governing Law. This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

(NAME)

STATE OF MAINE

, ss

(County)

_____, 19~~20~~.

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

Notary Public

B. Wooded buffer, no disturbance

DECLARATION OF RESTRICTIONS

(Wooded Buffer, No Disturbance)

THIS DECLARATION OF RESTRICTIONS is made this _____ day of _____,
_____, 19~~20~~, by _____, _____,
(name) (street address)
(city or town), _____ County, Maine, _____, (herein referred to as the
(county) (zipcode)
"Declarant"), pursuant to a permit received from the Maine Department of Environmental Protection
under the Stormwater Management Law, to preserve a buffer area on a parcel of land near
_____,
(road name) (known feature and/or town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(town)
described in a deed from _____ to _____ dated _____
(name) (name of Declarant)
_____, 19____20____, and recorded in Book _____ Page _____ at the
_____ County Registry of Deeds, herein referred to as the "property"; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows: (Note: Insert description of restricted buffer location here)

WHEREAS, pursuant to the Stormwater Management Law, 38 M.R.S.A. Section 420-D and Chapter 500 of rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"), Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions

and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1. Restrictions on Restricted Buffer Area. Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.

a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Restricted Buffer Area, nor shall the topography of the area be altered or manipulated in any way;

b. No trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained;

c. No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;

d. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence;

e. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area;

f. Any level spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. Enforcement. The MDEP may enforce any of the Restrictions set forth in Section 1 above.

3. Binding Effect. The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.

4. Amendment. Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.

5. Effective Provisions of Declaration. Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.

6. Severability. Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.

7. Governing Law. This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

(NAME)

STATE OF MAINE

, ss

(County)

_____, 19~~20~~.

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

Notary Public

and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1. Restrictions on Restricted Buffer Area. Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.

a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Restricted Buffer Area, nor may the topography or the natural mineral soil of the area be altered or manipulated in any way;

b. A dense cover of grassy vegetation must be maintained over the Restricted Buffer Area, except that shrubs, trees and other woody vegetation may also be planted or allowed to grow in the area. The Restricted Buffer Area may not be maintained as a lawn or used as a pasture. If vegetation in the Restricted Buffer Area is mowed, it may be mown no more than three times per year, to a height of no less than 6 inches.

c. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence;

d. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area, except for vehicles used in mowing;

e. Any level spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. Enforcement. The MDEP may enforce any of the Restrictions set forth in Section 1 above.

3. Binding Effect. The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.

4. Amendment. Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.

5. Effective Provisions of Declaration. Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.

6. Severability. Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.

7. Governing Law. This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

(NAME)

STATE OF MAINE

, ss

(County)

_____, 19~~19~~20.

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

Notary Public

APPENDIX G. Treatment Levels for Various Classes of Additional stormwater treatment measures for use as Best Management Practices (BMPs)

12/30/03

Treatment Level—LOW

<u>BMP Type</u>	<u>Quality Sizing/Treatment Volume</u>	<u>Quantity Control Benefits</u>
<u>Flow-through Sedi-mentation Devices</u>	<u>1-yr peak flow ≤ DEP approved flow for the device. Bypass flow > DEP approved flow for the device.*</u>	<u>None</u>
<u>Vegetated Filters / Buffers</u>	<u>Waiting for John's info</u>	<u>Waiting for John's info</u>
<u>Extended Detention</u>	<u>12-hour extended detention of one-year storm</u>	<u>Provides channel protection</u>
<u>Under-drained Soil Filters/ Filter Devices</u>	<u>0.4" runoff from impervious areas + 0.2" runoff from non-impervious developed areas (only 0.1" if non-impervious areas are HG-Class A soils or under-drained soils)</u>	
<u>Infiltration Systems</u>	<u>0.4" runoff from impervious areas + 0.2" runoff from non-impervious developed areas (only 0.1" if non-impervious areas are HG-Class A soils or under-drained soils)</u>	
<u>Swales w/ check dams</u>	<u>$\frac{2}{3}$</u>	<u>$\frac{2}{3}$</u>

The above quality sizing/treatment volumes apply if at least 95% of the developed area in the project is treated. If less than 95% is being treated, the treatment volume for the BMPs providing treatment must be adjusted as follows:

New treatment volume (TV) = TV impervious from table [1 + (% impervious untreated)/100] + TV non-impervious from table [1 + (% non-impervious untreated)/100]

In all cases at least 80% of the project's developed area, including at least 80% of the project's non-roof impervious areas, must be treated.

"Developed areas" include all impervious areas, lawns, and landscaped shrub and garden areas, but do not include forest or meadow.

* DEP approved flow = flow at which at least 80% of OK-110 size silica sand during DEP confirmed test of device.

Treatment Level— MEDIUM

<u>BMP Type</u>	<u>Quality Sizing/Treatment Volume</u>	<u>Quantity Control Benefits</u>
<u>Vegetated Filters/ Buffers</u>	<u>Waiting for John's info</u>	<u>Waiting for John's info</u>
<u>Under-drained Soil Filters/ Filter Devices</u>	<u>0.7" runoff from impervious areas + 0.3" runoff from non-impervious developed areas (only 0.15" if non-impervious areas are HG Class A soils or under-drained soils); Treatment volume reduced by 25% if non-roof runoff pretreated approved flow through sedimentation device.*</u>	<u>Provides channel protection</u>
<u>Infiltration Systems</u>	<u>0.7" runoff from impervious areas + 0.3" runoff from non-impervious developed areas (only 0.15" if non-impervious areas are HG Class A soils or under-drained soils); Treatment volume reduced by 25% if non-roof runoff pretreated approved flow through sedimentation device.*</u>	<u>Provides channel protection</u>
<u>Extended Detention</u>	<u>12 hour extended detention of one year storm with under-drained gravel outlet</u>	<u>Provides channel protection</u>
<u>Wet Ponds</u>	<u>Permanent Pool volumes w/o ice</u> <u>Length:Width ≥ 4:1</u> <u>1.0" runoff from impervious areas</u> <u>0.4" runoff from non-impervious developed areas (only 0.2" if non-impervious areas are HG Class A soils or under-drained soils);</u> <u>Length:Width = 2:1—4:1</u> <u>1.5" runoff from impervious areas</u> <u>0.6" runoff from non-impervious developed areas (only 0.3" if non-impervious areas are HG Class A soils or under-drained soils);</u> <u>Length:Width = 1:1—2:1</u> <u>2.0" runoff from impervious areas</u> <u>0.8" runoff from non-impervious developed areas (only 0.4" if non-impervious areas are HG Class A soils or under-drained soils);</u> <u>note: if 2 ponds are used, total volume may be reduced by 20%</u>	<u>Channel Protection provided if 12 hour extended detention of 1 year storm is included on top of permanent pool</u> <u>Flood protection provided if 25 year peak flow detention is provided on top of permanent pool</u>

The above quality sizing/treatment volumes apply if at least 95% of the developed area in the project is treated. If less than 95% is being treated, the treatment volume for the BMPs providing treatment must be adjusted as follows:

New treatment volume (TV) = TV impervious from table [1 + (% impervious untreated)/100] + TV non-impervious from table [1 + (% non-impervious untreated)/100]

In all cases at least 80% of the project's developed area, including at least 80% of the project's non-roof impervious areas, must be treated.

“Developed areas” include all impervious areas, lawns, and landscaped shrub and garden areas, but do not include forest or meadow.

* DEP approved flow = flow at which at least 80% of OK-110 size silica sand during DEP confirmed test of device.

Treatment Level—HIGH

<u>BMP Type</u>	<u>Quality Sizing/Treatment Volume</u>	<u>Quantity Control Benefits</u>
<u>Vegetated Filters/ Buffers</u>	<u>Waiting for John’s info</u>	<u>Waiting for John’s info</u>
<u>Under-drained Soil Filters/ Filter Devices</u>	<u>1.0” runoff from impervious areas + 0.4” runoff from non-impervious developed areas (only 0.2” if non-impervious areas are HG Class A soils or under-drained soils). Treatment volume reduced by 25% if non-roof runoff pretreated approved flow through sedimentation device.*</u>	<u>Provides channel protection</u>
<u>Infiltration Systems</u>	<u>1.0” runoff from impervious areas + 0.4” runoff from non-impervious developed areas (only 0.2” if non-impervious areas are HG Class A soils or under-drained soils). Treatment volume reduced by 25% if non-roof runoff pretreated approved flow through sedimentation device.*</u>	<u>Provides channel protection</u>
<u>Extended Detention</u>	<u>12 hour extended detention of one year storm with under-drained soil filter outlet</u>	<u>Provides channel protection</u>
<u>Wet Ponds</u>	<u>Permanent Pool volumes w/o ice</u> <u>Length:Width ≥ 4:1</u> <u>2.0” runoff from impervious areas</u> <u>0.8” runoff from non-impervious developed areas (only 0.4” if non-impervious areas are HG Class A soils or under-drained soils).</u> <u>Length:Width = 2:1—4:1</u> <u>2.5” runoff from impervious areas</u> <u>1.0” runoff from non-impervious developed areas (only 0.5” if non-impervious areas are HG Class A soils or under-drained soils).</u> <u>Length:Width = 1:1—2:1</u> <u>3.0” runoff from impervious areas</u> <u>1.2” runoff from non-impervious developed areas (only 0.6” if non-impervious areas are HG Class A soils or under-drained soils).</u> <u>note: if 2 ponds are used, total volume may be reduced by 20%</u>	<u>Channel Protection provided if 12 hour extended detention of 1 year storm is included on top of permanent pool</u> <u>Flood protection provided if 25 year peak flow detention is provided on top of permanent pool</u>

The above quality sizing/treatment volumes apply if at least 95% of the developed area in the project is treated. If less than 95% is being treated, the treatment volume for the BMPs providing treatment must be adjusted as follows:

New treatment volume (TV) = TV impervious from table [1 + (% impervious untreated)/100] +

TV non impervious from table [1 + (% non impervious untreated)/100]

In all cases at least 80% of the project's developed area, including at least 80% of the project's non-roof impervious areas, must be treated.

"Developed areas" include all impervious areas, lawns, and landscaped shrub and garden areas, but do not include forest or meadow.

* ~~DEP approved flow = flow at which at least 80% of OK 110 size silica sand during DEP confirmed test of device.~~[note to reviewers: this appendix is currently under development]

AUTHORITY: 38 M.R.S.A. §§ 341-D, 420-D, ~~and~~ 484, and 413

EFFECTIVE DATE: December 31, 1997

AMENDED, EFFECTIVE DATE: